

Lubrication system components, servicing

Note:

- ◆ *When working on the engine it should be secured to assembly stand VW 313 using engine bracket 3269 or VW 540 and supplementary set 540/1 B.*
- ◆ *The oil level must not be above the max. mark - danger of damage to catalytic converter! Marks ⇒ [Page 17-8](#) , ⇒ [Fig. 2](#) .*
- ◆ *If, when repairing an engine, metal shavings or large amounts of small metal particles are found in the engine oil, caused for example by partial seizure of crankshaft or conrod bearings, perform the following work sequences to prevent consequential damage once repairs are complete:*
 - - *Thoroughly clean oil passages*
 - - *Replace oil spray jets*
 - - *Replace oil cooler*
 - - *Replace oil filter*
 - - *Replace oil non-return valve*

Disassembling and assembling oil filter housing ⇒ [Page 17-9](#) .

Disassembling and assembling oil pump ⇒ [Page 17-12](#) .

Checking oil pressure and oil pressure switch ⇒ [Page 17-19](#) .

Oil system capacity

⇒ *Fluid Capacity Chart*

Engine oil specifications

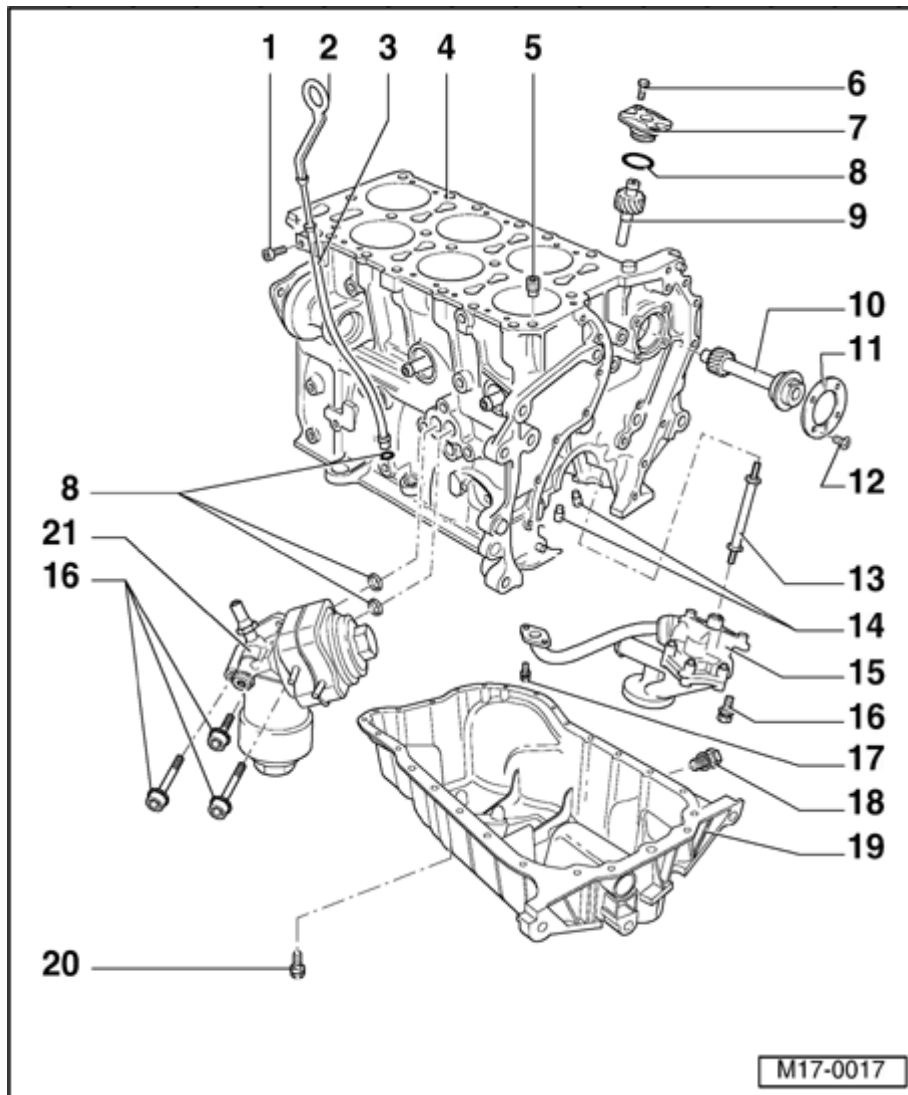
New VW standard (specially developed, age resistant)

Initial filling: VW standard: 503 00 (VW TL 52 173)

Note:

In the factory the engine is filled with engine oil according to VW standard 503 00. This engine oil is adjusted for long service intervals (ESI). However, you can also use the engine oils listed below.

Use engine oils according to VW standard 500 00, 501 01 or 502 00. Multi-grade oils corresponding to API-SJ or SL are also acceptable.

**1 - 8 Nm**

- ◆ Secured to intake manifold

2 - Dipstick

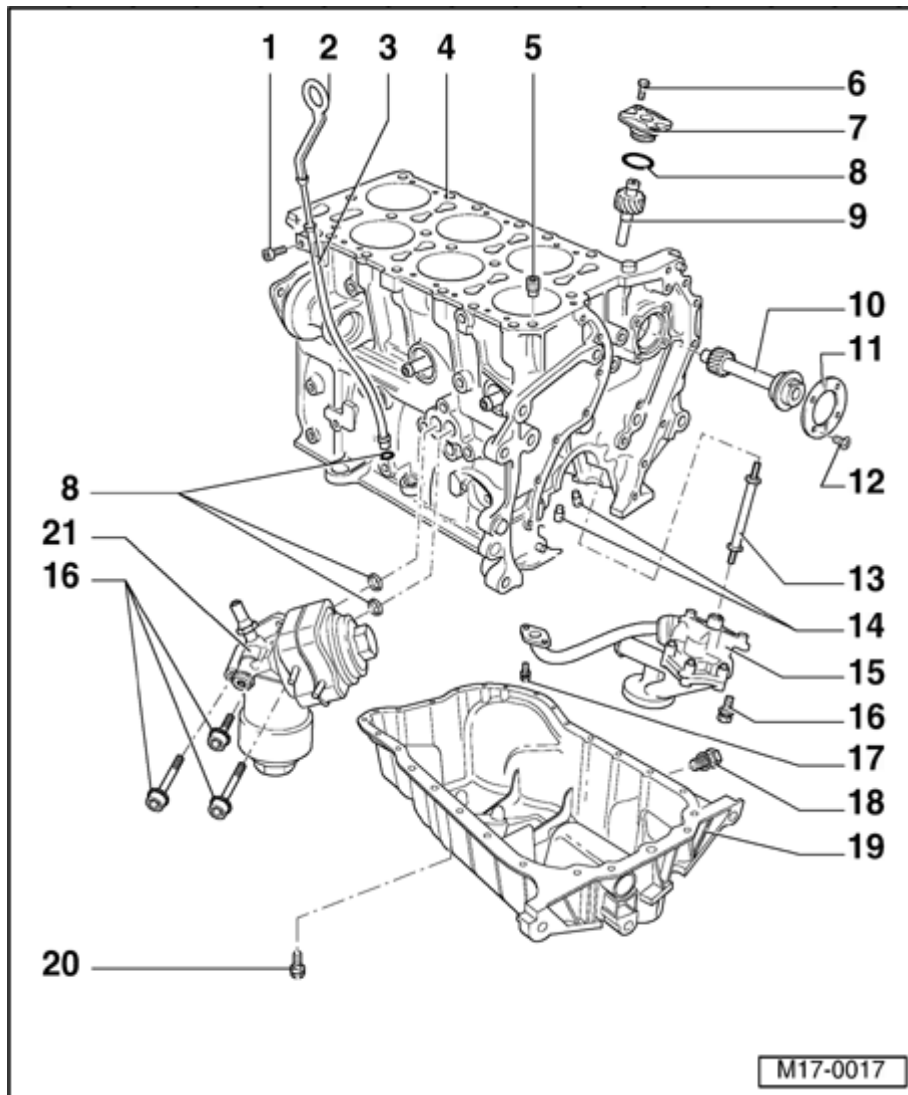
- ◆ Oil level must not exceed the max. mark!
- ◆ Markings ⇒ [Fig. 2](#)

3 - Guide tube

- ◆ For dipstick
- ◆ Secured by a bolt to intake manifold

4 - Cylinder block

- ◆ Removing and installing sealing flange and dual-mass flywheel ⇒ [Page 13-22](#)
- ◆ Removing and installing crankshaft ⇒ [Page 13-34](#)
- ◆ Disassembling and assembling piston and conrod ⇒ [Page 13-39](#)

**13 - Drive shaft**

- ◆ For oil pump drive

14 - Oil spray jet

- ◆ For crankshaft bearings 2...7
- ◆ For piston cooling
- ◆ Opening pressure: 2.0 bar
- ◆ Removing and installing ⇒ [Fig. 1](#)
- ◆ See note ⇒ [Page 17-1](#)

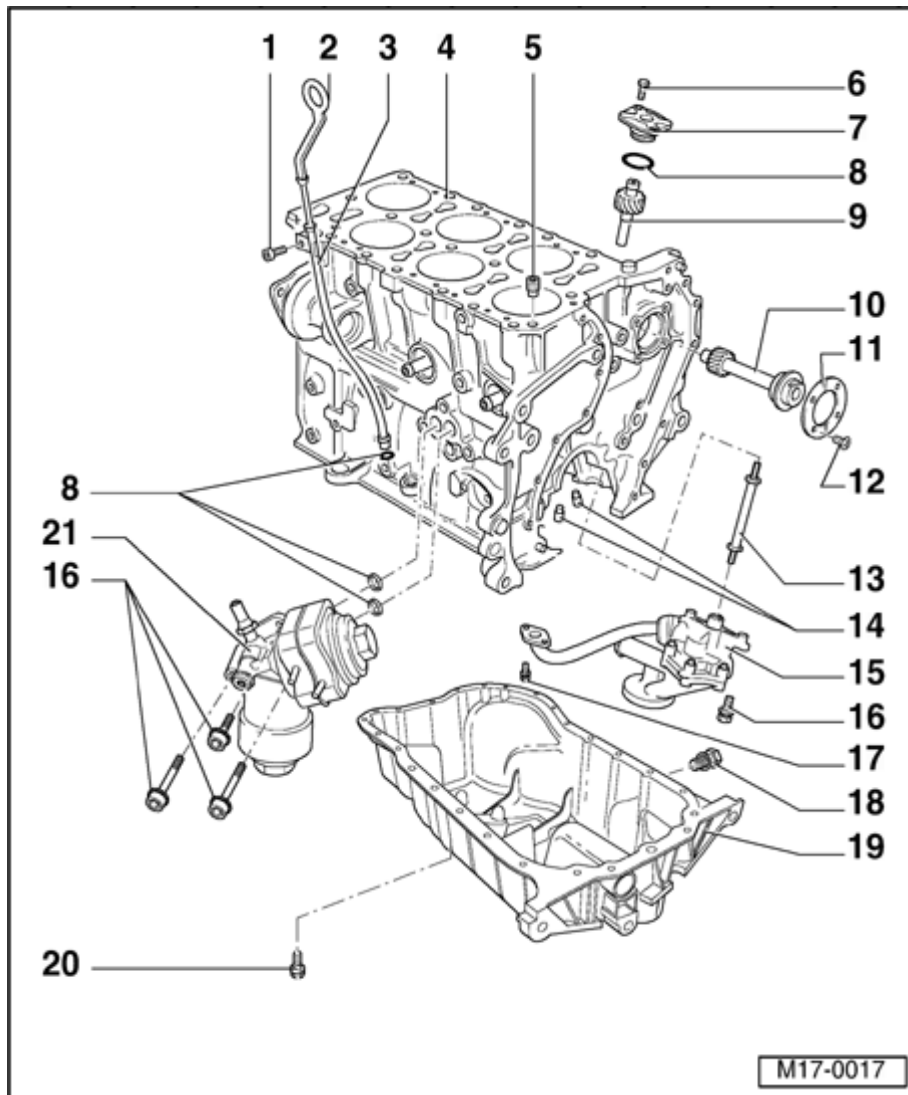
15 - Oil pump

- ◆ Disassembling and assembling ⇒ [Page 17-12](#)
- ◆ Coat oil pressure pipe with sealing compound AMV 188 001 02 at cylinder block and oil pump housing

16 - 23 Nm**17 - 8 Nm**

- ◆ Insert with

locking
compound
D 000 600
A2



18 - Oil drain plug, 30 Nm

- ◆ Replace if leaking

19 - Oil pan

- ◆ Removing and installing ⇒ [Page 17-15](#)

20 - 12 Nm

21 - Oil filter housing

- ◆ See note ⇒ [Page 17-1](#)

- ◆ Disassembling and assembling ⇒ [Page 17-9](#)

- ◆ Coolant hose connection diagram ⇒ [Page 19-11](#)

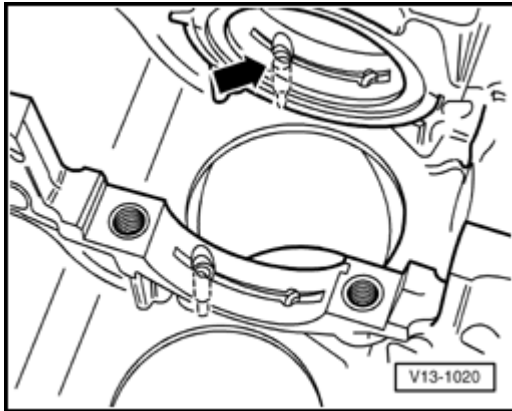


Fig. 1 Removing and installing oil spray jet

Special tools and equipment

- ◆ 4 mm diameter drift
- ◆ 6 mm diameter drift

Note:

Oil spray jets are installed in main bearings 2....7.

Removing

- Press oil spray jet out toward bearing using a 4 mm diameter drift.

Installing

- To install, press oil spray jet in by hand using a 6 mm diameter drift (arrow).

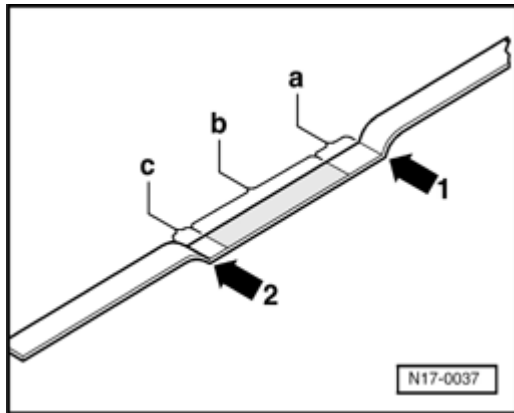


Fig. 2 Dipstick markings

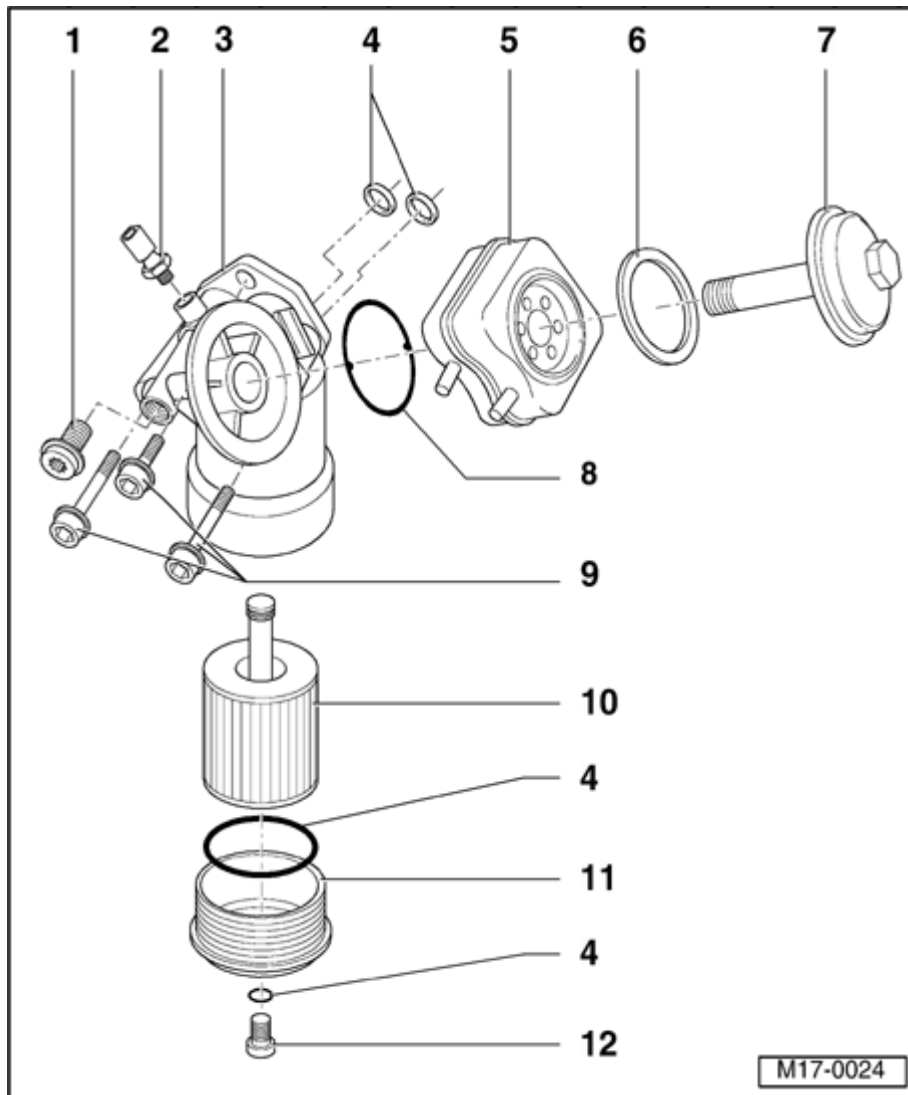
1 - Max. mark

2 - Min. mark

a - Area above hatched field up to max. mark: Do not replenish engine oil!

b - Oil level within hatched field: Engine oil may be replenished

c - Area from min. mark up to hatched field: Replenish with max. 0.5 liters of engine oil!



Oil filter housing, disassembling and assembling

1 - Sealing plug, 10 Nm

- ◆ If seal is leaking nip open and replace.

2 - 1.4 bar Oil pressure switch - F1-, 20 Nm

- ◆ Marking: black
- ◆ If seal is leaking nip open and replace.

- ◆ Checking ⇒ [Page 17-19](#)

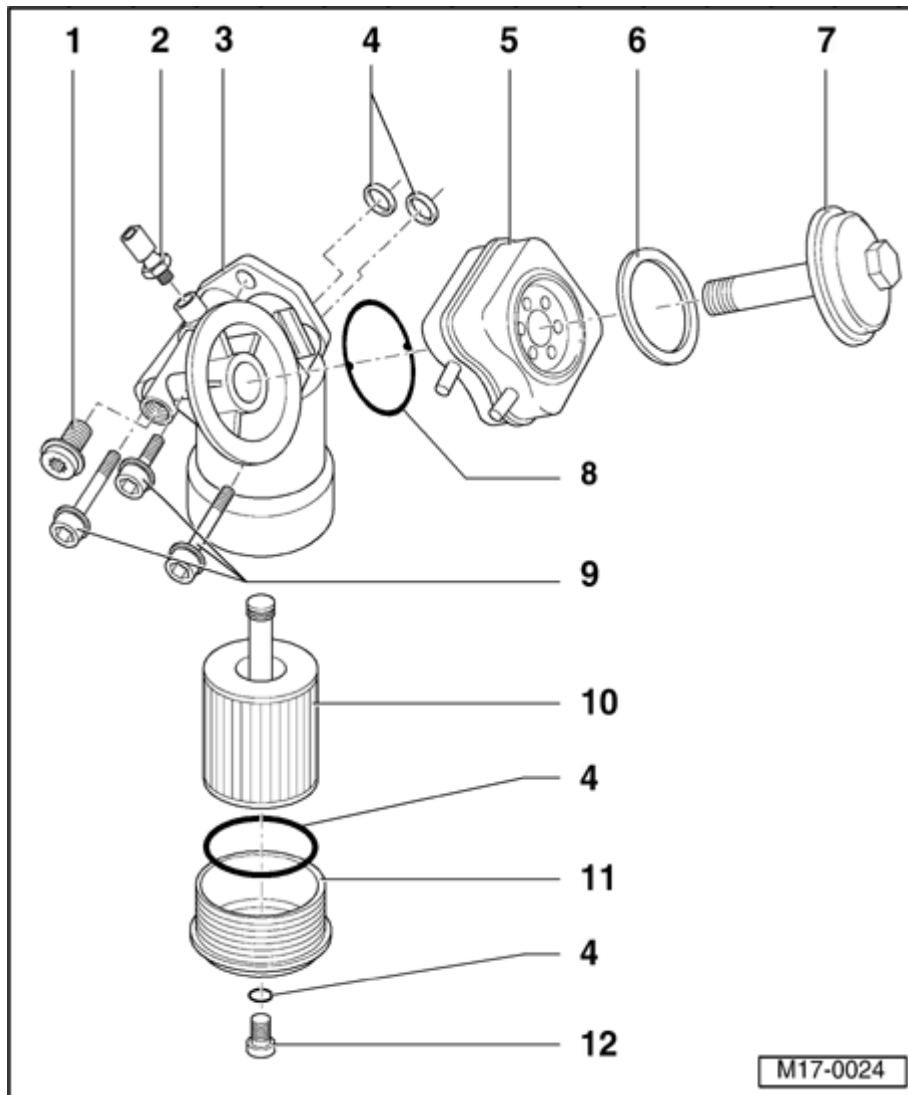
3 - Oil filter housing

- ◆ With non-return valve, Opening pressure: 0.05 bar

4 - O-ring

- ◆ Replace
- ◆ Lubricate before installing

17-10



5 - Oil cooler

- ◆ Ensure clearance to adjacent components
- ◆ Coat contact area outside seal with sealing compound AMV 188 001 02
 - ◆ See Note ⇒ [Page 17-1](#)
- ◆ Coolant hose connection diagram ⇒ [Page 19-11](#)

6 - Seal

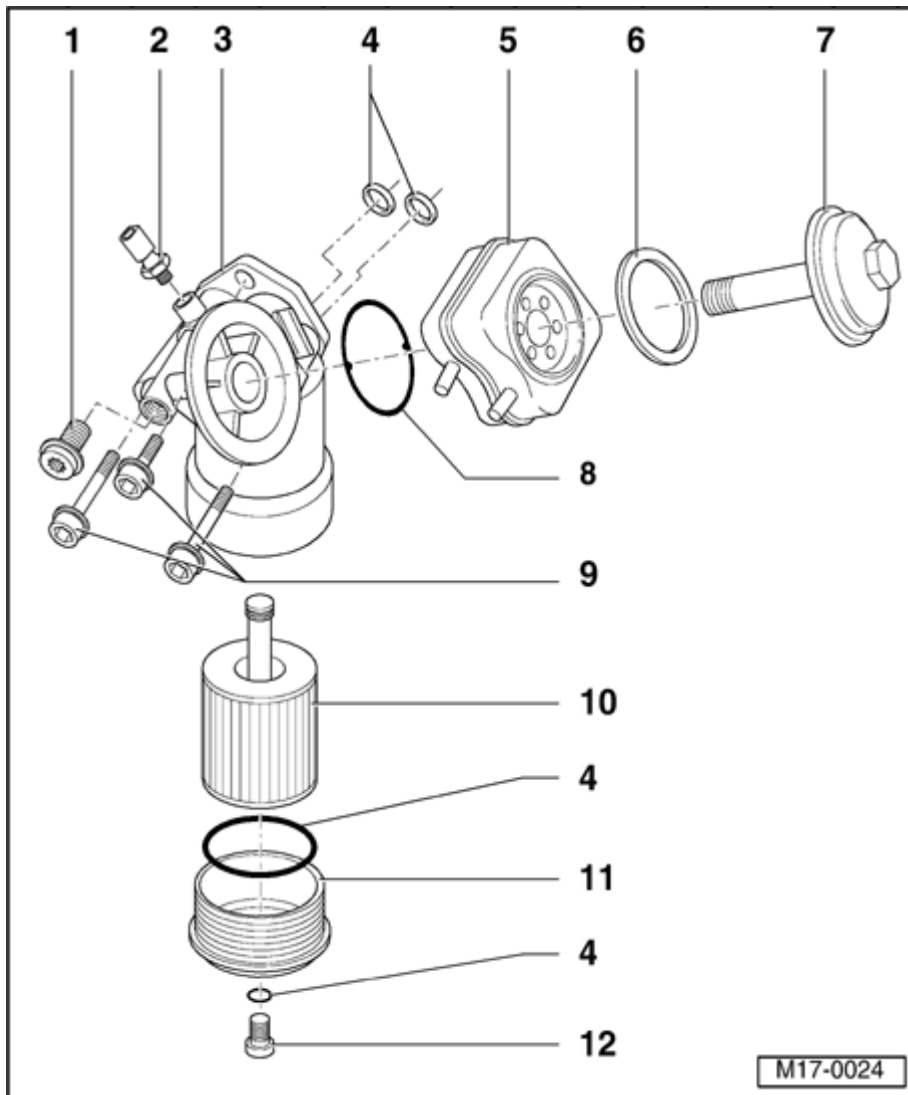
- ◆ Replace
- ◆ Lubricate before installing

7 - Oil cooler cover, 25 Nm

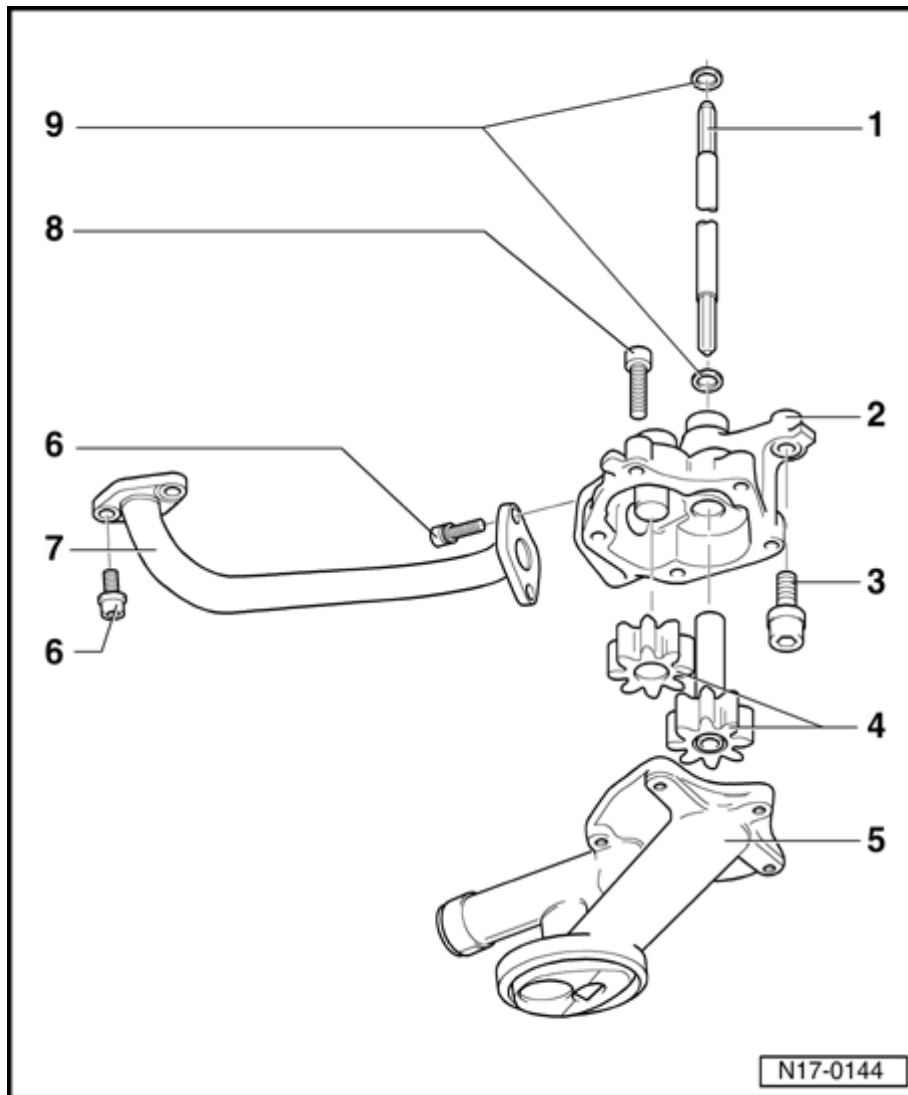
8 - O-ring

- ◆ Replace
- ◆ Lubricate before installing
- ◆ Insert into oil

cooler
before
installing
oil
cooler



- 9 - 23 Nm**
- 10 - Oil filter element**
- ◆ Observe change intervals
- ◆ See Note ⇒ [Page 17-1](#)
- 11 - Oil filter lower part, 25 Nm**
- ◆ Drain before removing
- ◆ With bypass valve, Opening pressure: 2.50 bar
- 12 - Oil drain plug, 10 Nm**



Oil pump, disassembling and assembling

1 - Drive shaft

- ◆ For oil pump drive

2 - Oil pump housing

3 - 23 Nm

4 - Gears

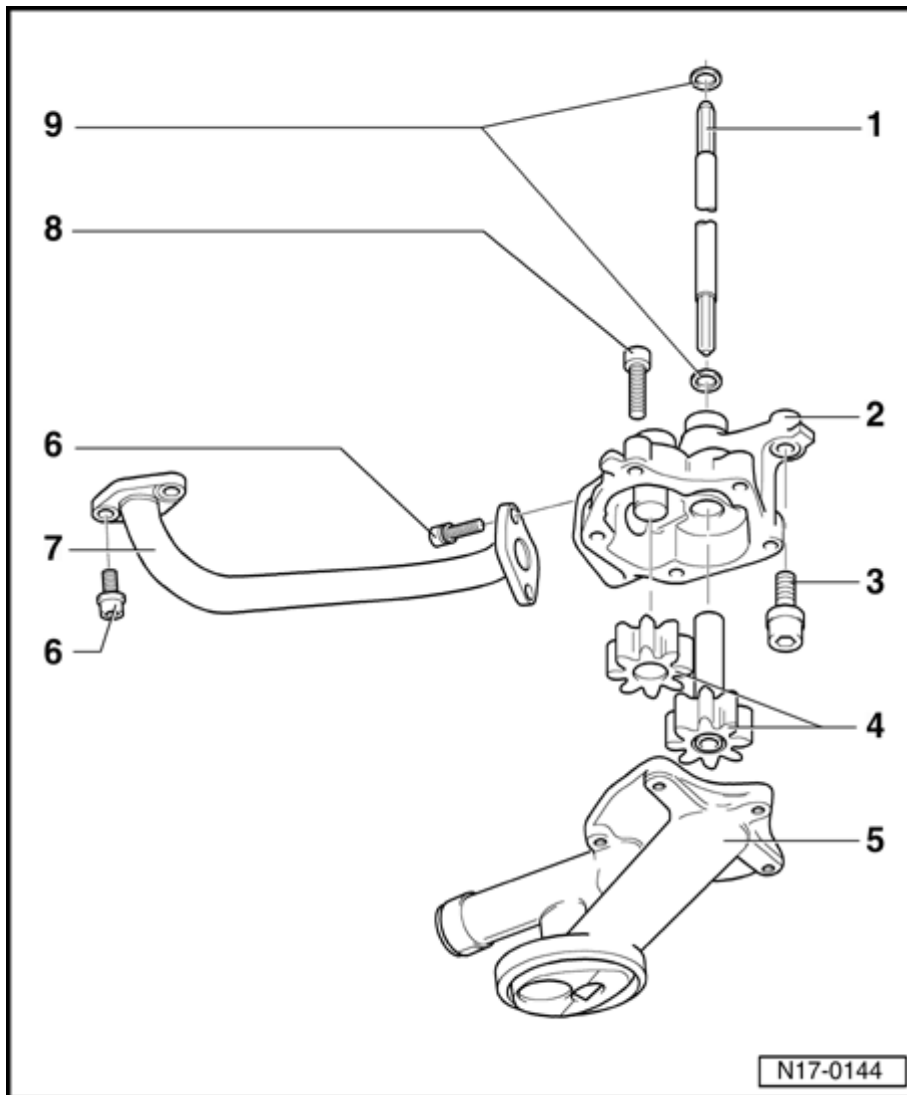
- ◆ Checking backlash ⇒ [Fig. 1](#)
- ◆ Checking axial clearance ⇒ [Fig. 2](#)

5 - Oil pump cover with pressure relief valve

- ◆ Clean strainer if soiled
- ◆ Opening pressure: 5.3...5.7 bar

6 - 8 Nm

- ◆ Insert with locking compound D 000 600 A2



7 - Oil pressure pipe

◆ Coat cylinder block and oil pump housing with sealing compound AMV 188 001 02

8 - 8 Nm

9 - Seal

◆ Replace if damaged

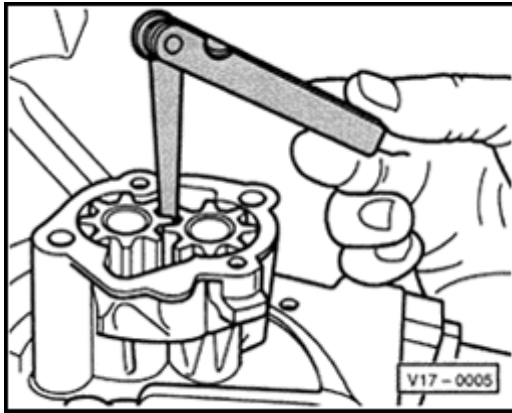


Fig. 1 Checking oil pump backlash

Special tools and equipment

- ◆ Feeler gauge
- Wear limit: 0.20 mm

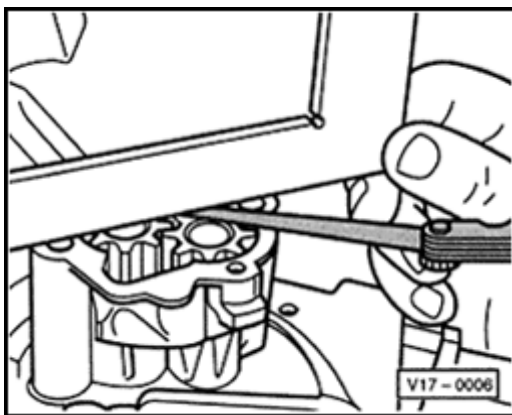


Fig. 2 Checking oil pump axial clearance

Special tools and equipment

- ◆ Straight edge
- ◆ Feeler gauge
- Wear limit: 0.10 mm

Oil pan, removing and installing

Special tools and equipment

- ◆ VAG 1331 Torque wrench (5...50 Nm)
- ◆ D 176 404 A2 Silicone sealing compound
- ◆ Hand drill with plastic brush attachment
- ◆ Flat scraper
- ◆ Protective goggles

Removing

- Remove center, left and right insulation trays:

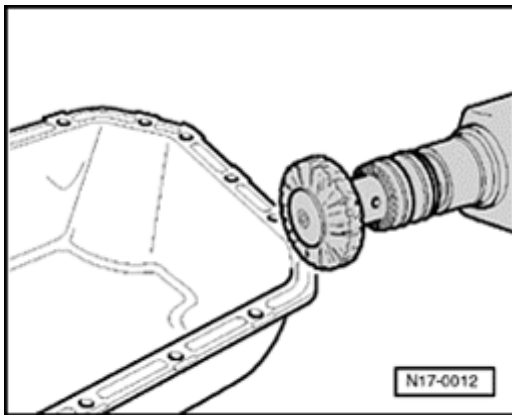
⇒ [Repair Manual, Body Exterior, Repair Group 50](#)

- Unscrew bracket for Secondary Air Injection (AIR) pump motor -V101- from oil pan and from cylinder block ⇒ [Page 26-26](#) , item - 17 -.
- Drain engine oil.

Note:

Observe waste disposal regulations!

- Remove oil pan.



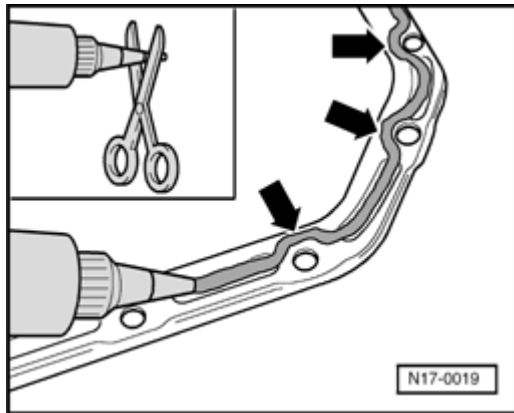
- If necessary loosen oil pan with light blow rubber mallet.
- Remove sealant residue from cylinder block with a flat scraper.
- Remove sealant residue from pan with a brush, e.g. a hand drill with a plastic brush attachment (wear protective goggles).
- Clean sealing surfaces. They must be free of dirt and grease.

Installing

Note:

- ◆ *Note the expiration date of the sealing compound.*
- ◆ *Oil pan must be installed within 5 minutes of applying silicone sealing compound.*

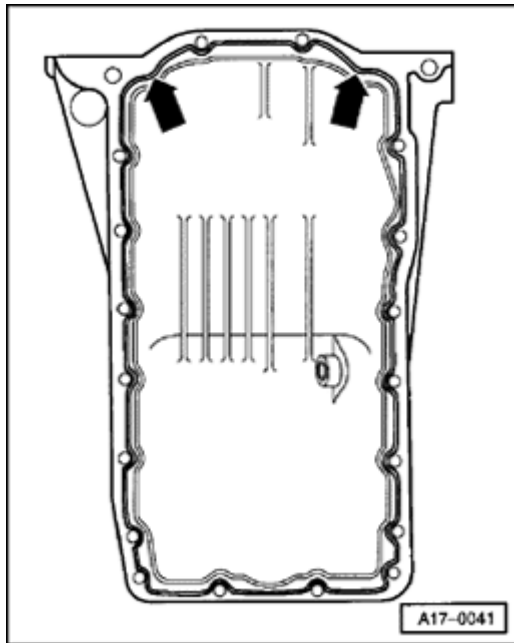
17-17



- Cut off tube nozzle at front marking (nozzle approx. 3 mm diameter).
- Apply silicone sealing compound, as shown, to clean oil pan sealing surface. Sealing compound bead must be:
 - ◆ 2...3 mm thick,
 - ◆ and run on inside of bolt holes (arrows).

Note:

The sealing compound bead must not be thicker, otherwise excess sealing compound will enter the oil pan and may block the oil suction pipe strainer.

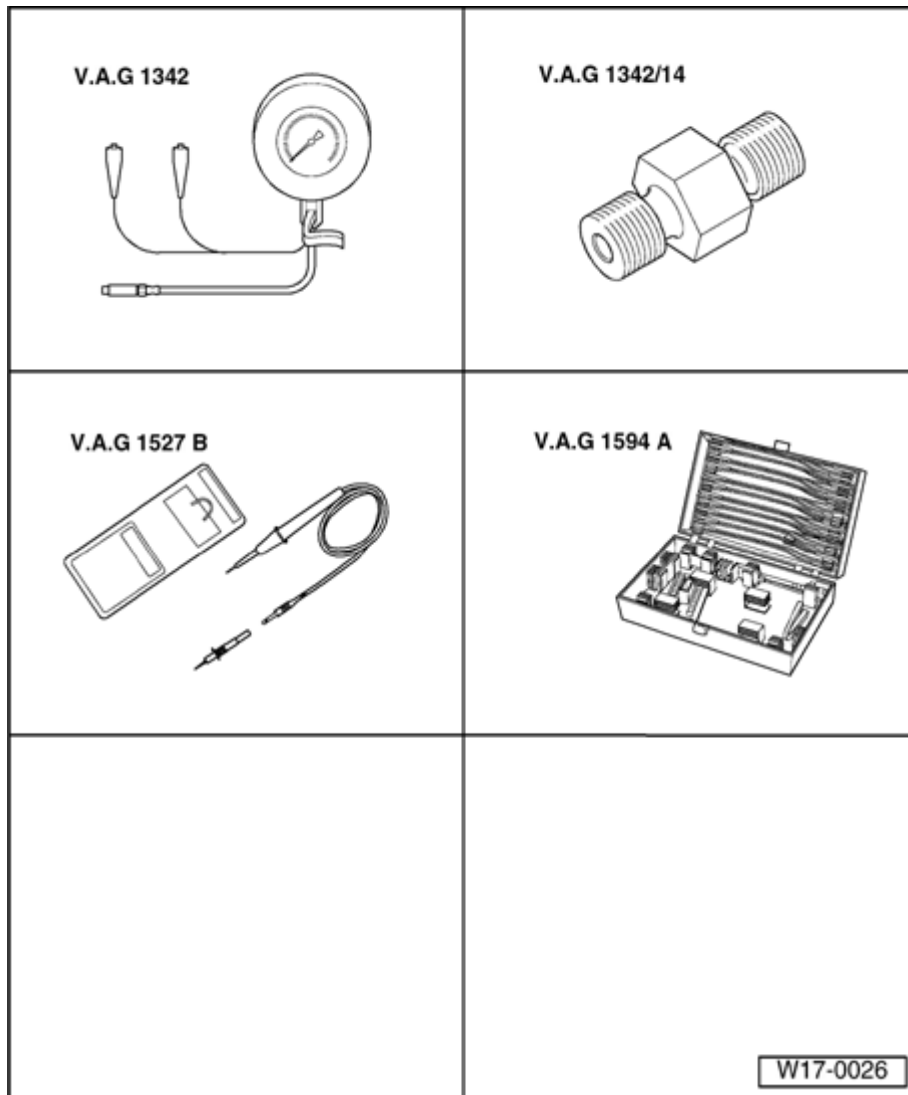


- Apply silicone sealing compound bead as illustrated to clean sealing surface of oil pan.
- Install oil pan immediately and tighten all pan bolts lightly.
- Tighten oil pan bolts to 12 Nm.
- Tighten bolts for pan/transmission to 45 Nm.
- Tighten bracket for secondary air pump motor:
 Securing bolts to oil pan: 8 Nm
 Securing bolts to cylinder block: 20 Nm

Note:

The sealing compound must be allowed to cure for approx. 30 minutes after installing the oil pan. After this time the engine may be filled with engine oil.

The rest of the assembly is basically in reverse order to the disassembling sequence.



Oil pressure and oil pressure switch, checking

Special tools and equipment

- ◆ VAG 1342 Oil pressure tester
- ◆ VAG 1342/14 Adapter
- ◆ VAG 1527 B Diode test lamp
- ◆ VAG 1594 A Adapter set

Test conditions

- Engine oil level OK, checking ⇒ [Page 17-8](#) , ⇒ [Fig. 2](#) .
- Engine oil temperature at least 80 °C (coolant fan must have run once).
- Selector lever must be in position "P" or "N" on vehicles with an automatic transmission.

Note:

Functional check and servicing the optical and acoustic oil pressure warning:

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

Checking oil pressure switch

- Remove center, left and right insulation trays:

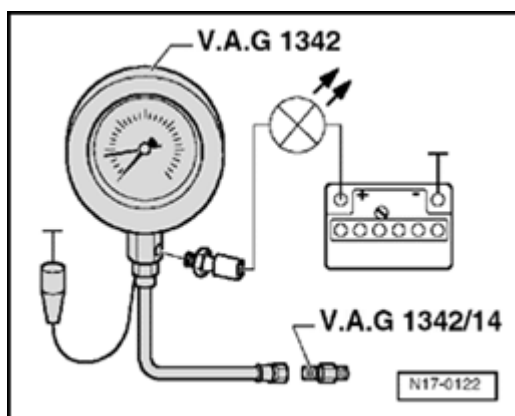
⇒ [Repair Manual, Body Exterior, Repair Group 50](#)

- Remove front bumper:

⇒ [Repair Manual, Body Exterior, Repair Group 63](#)

- Bring lock carrier into service position:

⇒ [Repair Manual, Body Exterior, Repair Group 50](#)



- Remove Oil pressure switch -F1- and screw into tester.
- Screw tester VAG 1342 with adapter VAG 1342/14 into oil filter bracket instead of oil pressure switch.

Note:

Observe installation position of adapter: The tapered connecting socket of the adapter is screwed to the pressure hose of the tester.

- Connect brown wire of tester to Ground (-).
- Connect diode test lamp VAG 1527 B to battery positive (+) and oil pressure switch using adapter cables from VAG 1594 A.

LED must not light up.

If the LED lights up:

- Replace Oil pressure switch -F1- ⇒ [Page 17-9](#) , item - 2 -.

If the LED does not light up:

- Start engine and run at idling speed. At 1.2...1.6 bar LED must light up; otherwise replace Oil pressure switch -F1- ⇒ [Page 17-9](#) , item - 2 -.

Checking oil pressure

- Check oil pressure at different revolutions:

2,000 rpm: 3.0...5.5 bar

above 2,000 rpm: maximum 7.0 bar.

If the specifications are not attained:

- Repair mechanical damage, e.g. bearing damage.

At higher engine speeds oil pressure must not exceed 7.0 bar.

If the specification is exceeded:

- Check oil galleries.
- Replace oil pump if necessary ⇒ [Page 17-12](#) ,
Disassembling and assembling oil pump.